

Coelogyne tiomanensis, Henderson, sp. nov.

Pseudobulbus ovoideus, sulcatus, monophyllus, 3–4 cm. longus. Folium lanceolatum, acutum, 15–18 cm. longum. Petiolus 4–5 cm. longus. Racemus 6–8 cm. longus, biflorus. Bracteae lanceolatae, acutae, 1.5 cm. longae, deciduae. Sepalum dorsale oblongo-lanceolatum, acutum, carinatum, 4 cm. longum. Sepala lateralalia 3.5 cm. longa. Petala anguste linearia oblonga, circa 4 cm. longa. Labellum trilobatum, lobi laterales oblongo-semicordati, erecti, antice rotundati; lobus medius triangulo-ovatus, mucronatus, apice margineque reflexus; carinae duae. Gynostemium lobis lateralibus labelli aequilongum, cucullatum.

Pseudobulbs ovoid, strongly 4-ridged, 3–4 cm. long, leaf one. Raceme from the side of the pseudobulb in axil of leaf, 6–8 cm. long. Flowers two. Leaves lanceolate acute, 15–18 cm. long, petiole 4–5 cm. long. Bracts lanceolate acute, caducous, 1.5 cm. long. Upper sepal oblong lanceolate acute, keeled, 4 cms. long. Lateral sepals narrower, slightly falcate 3.5 cm. long. Petals narrow linear oblong, 4 cm. long, or nearly. Sidelobes of lip large erect oblong, semicordate, rounded, blunt; midlobe triangular-ovate, notched, mucronate, edges and tip recurved, 1.6 cm. long and broad. Keels two, strongly marked, undulate, extending half-way down midlobe and ending abruptly. Column as long as sidelobes of lip, the hood large, ovate blunt.

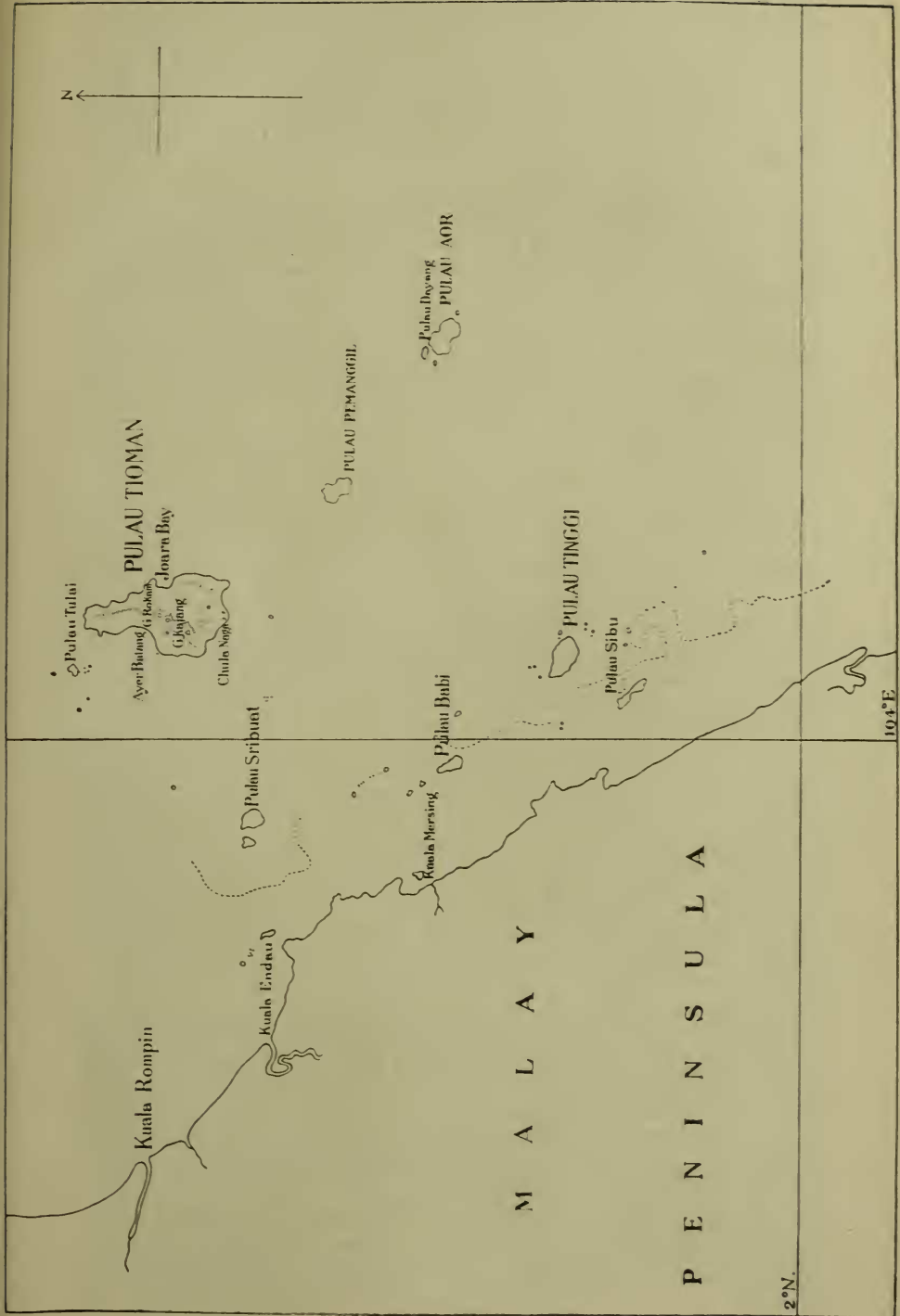
P. TIOMAN, summit of Gunong Kajang, 3383 ft., Henderson 18263; summit of Gunong Rokam, c. 3000 ft., Henderson 18397 (type). Live specimens were brought to Singapore and flowered in the Botanic Gardens.

The sepals are of a very pale flesh colour with yellow midrib; the petals greenish or pale flesh colour; the sidelobes of the lip white veined with brown; midlobe of the lip dark brown in the centre, the keels also dark brown shading to light brown at the edges; the column greenish with two faint brown streaks below; the hood reddish brown.

NOTES ON THE FLORA OF PULAU TIOMAN AND NEIGHBOURING ISLANDS.

BY M. R. HENDERSON, F.L.S.

Pulau Tioman and its neighbours have been but little explored from a botanical point of view. Up till the time of the writer's visit, collections had not been made above the thousand foot contour.



Pulau Tioman and Neighbouring Islands.

Of the group of islands off the east coast of Johore and Pahang, shown in the accompanying sketch map, collections of plants have been made only on Pulau Tioman and Pulau Tulai, Pulau Tinggi, Pulau Aor and Pulau Dayang. The most interesting is Pulau Tioman, because of its greater elevation above sea-level, and its greater area of untouched forest.

All these islands lie in shallow water, and their flora, as one would expect, is typically Malay Peninsular. Seven plants, however, have, up to the present, not been reported from the Peninsula. All of these, with one exception, are known from Borneo. A list of them is given later.

The writer, accompanied by Mr. N. Smedley of Raffles Museum, Singapore, and a party of collectors, spent the period between April 24th and May 29th, 1927, on Pulau Aor, Pulau Dayang and Pulau Tioman.

PULAU AOR.

The first week was spent on Pulau Aor and collecting was done up to an altitude of about 1000 feet from the village at Telok Berhala on the north side of the island.

At the time of our visit the population of Aor was said to be about 400, including a few families who lived on Pulau Dayang, the principal occupations being the cultivation of coconuts, and fishing. The population was at one time more considerable than it is now, for the island in past days was a haunt of pirates.

J. T. Thomson, a Government surveyor, visited it in July, 1849, and described it in Logan's Journal, Vol. IV. He gives the dimensions of the island as three miles by one and a half miles, and the height of its two peaks as 1521 and 1805 feet, and says that it contained 1,400 inhabitants.

That the island had a much more extensive cultivation some seventy or eighty years ago than it has today is clearly shown by the following extracts from Thomson's description.

"The bays are fringed with tall cocoanuts of most luxuriant growth, and the trees do not seem to be restricted to the deeper soils for we found many existing amongst rocks and stones where little or no soil was perceptible. The tree is cultivated to the height of 1,000 feet above the level of the sea at which height, I was informed, they were sufficiently productive to repay the expense of their culture. The formation of the island is granitic and the soil is red, nor has it the appearance of being fertile otherwise than in the production of cocoanuts." "The inhabitants possess fine fruit groves amongst which the durian and mangosteen abound."

"It produces 70,000 cocoanuts and 5,000 gantangs of oil, which form its principal exports."

"The inhabitants of Pulo Aur are composed of free men and slaves. In former years the island formed a mart for the sale of captured men and prows, and was frequently visited by the Lanuns once so formidable on these coasts."

Evidence of this former occupation is to be found in the present state of the vegetation, which shows that cultivation at one time extended much further up the slopes than it does now. The clearing of the jungle and the subsequent denudation by rain exposes tumbled masses of granite boulders, between which the Malays build their houses and cultivate such food plants as Bananas, Tapioca and Caladium. Coconuts are planted on the sandflats of the little bays, and even amongst the boulders, appearing to thrive well enough wherever a little soil can collect. When abandoned, these cleared patches revert to a dense half-herbaceous, half-woody secondary growth much tangled by creepers, and later to poor secondary forest in which lianes are abundant.

At an altitude of about 400 to 500 feet above the village at Telok Berhala the jungle is poor, with few big trees and apparently no Dipterocarps. The undergrowth is dense with much tufted *Calamus* and *Daemonorops*, while in places the ground is covered with *Curculigo latifolia*. Large clumps of *Dendrocalamus* *sp.* are frequent, with *Aglaonema Schottianum* underneath them and an occasional specimen of the fungus *Dictyophora indusiata*. *Aralidium pinnatifidum*, with its bunches of irregularly shaped white fruits, was common and conspicuous.

On the rocky slopes nearer the sea, *Taxotrophis ilicifolia* is the commonest shrub under the trees, while masses of *Schefflera heterophylla* were seen scrambling over boulders.

At slightly higher altitudes—up to about 1,000 feet, *Orania macroclados* begins to appear in big clumps along with *Arenga saccharifera*. There is a greater depth of soil here and fewer exposed boulders, evidence, perhaps, that cultivation, if ever it did extend up the slopes as far as this, was abandoned very much earlier than that which altered the vegetation lower down. *Angiopteris* *sp.* begins to appear at about 700 feet, and *Homalomena purpurascens* carpets the ground in places at this altitude, replacing *Aglaonema Schottianum* of a few hundred feet lower.

Growing in large masses over bare boulders near sea level is *Quisqualis indica*, and associated with it is the common seashore orchid *Cymbidium Finlaysonianum* and the rarer *Haemaria discolor* var. *ordiana*.

As noted above, on the slopes of the ridge above the village at Telok Berhala, from about 600 ft. to 1,000 ft., *Arenga saccharifera* (Kabong), and *Orania macroclados* (Ibul), are exceedingly common. On Pulau Tinggi, Mr. Burkill reports, *Arenga Westerhoutii* (Langkap) takes the place of *A. saccharifera* and is associated with *Orania macroclados*. But on P. Tioman, *A. saccharifera* again appears and is very common up to an altitude of about 2,000 ft. being here associated with *Oncosperma horrida* (Bayas). *A. Westerhoutii* has not been reported authentically from P. Tioman, and the local Malays say that it is entirely absent from that island as it is from P. Aor. *Orania macroclados* occurs very sparingly on P. Tioman. These differences are interesting, but the reason for them is obscure.

Very little collecting has been done on P. Aor. J. B. Feilding visited it and P. Dayang in 1892 and made small collections which are in the Botanic Gardens, Singapore.

P. Dayang, to the north of P. Aor, is practically denuded of jungle and covered with coconut palms. The south aspect presents a smooth sloping face of rock with piled up masses of boulders at its base amongst which coconuts flourish. *Cycas Rumphii* was noticed in clefts of the rock, and *Spinifex squarrosus* was on the sandy beach. The latter appeared to be absent from P. Aor, or at least it was not seen on any of the sandy beaches visited.

PULAU TIOMAN.

Pulau Tioman is a rugged island lying about 48 miles due east of the mouth of the Rompin river in Pahang, and distant from the nearest point of the Malay Peninsula about 20 miles. It is about 12 miles long from north to south and its greatest breadth is about 6 miles. It is entirely mountainous, the highest peak being 3,383 feet above sea level, two lesser peaks reaching a little over 3,000 ft.

At the present day the inhabitants of Tioman number about 800, and it is probable that the island never held a much greater population. Except for the sandy flats of the bays, there is no level ground for cultivation, and the inhabitants confine themselves to these bays, only clearing for a short distance up the lower hill slopes.

Kaempfer touched at Tioman on his voyage to Japan in 1690, for the Dutch East Indiamen were in the habit of putting in to draw wood and water unmolested when voyaging from Batavia to Siam. He remarks that the inhabitants "are a sort of Bandittos who have been possessed of this island a considerable time and are of late grown so numerous that some years ago one of their Orang Kaya, who came on board one of our ships, boasted they were no

less than two thousand in number, tho' perhaps not half." He notes that the inhabitants wore bark-cloth and palm leaf hats and cultivated Mangos, Soursops, Pineapples, "small Lemons" and "Pinang trees." He does not mention the coconut palm. It is curious to note that the same type of small canoe with double paddles as Kaempfer describes is used to this day. (Kaempfer, *Voyage to Japan*, Vol. I, p. 5).

About 1849, J. T. Thomson visited Tioman and wrote an account of it in *Logan's Journal*, Vol. V. He gives the population as 200 and says that its produce was edible birds' nests, of which four piculs were exported yearly, dammar and other jungle products. Apparently even at this comparatively recent date, the cultivation of the coconut was of no importance on the island. Thomson remarks that "Tioman had been deserted to within these last ten years, having prior to that been subject to the attacks of the Illanuns. These pirates carried off 70 of the inhabitants about 20 years ago and sold them into slavery, during the interval the island remained desolate, the residue of the inhabitants that escaped from the pirates abandoned their homes, fleeing to Pahang, Johore and other places until the clearing of the coasts of this most formidable sect of sea marauders that infest the eastern seas had been effectually and it is to be hoped, finally accomplished in the year 1838."

"Pulo Tingi, Pulo Sibu, and adjacent islands also produce birds' nests." "The inhabitants, besides a little occasional quiet piracy, which it is not now either so profitable or so safe to indulge in, as formerly, spear the turtle, and gather their eggs, also collect beche-de-mer for the Singapore market."

P. Tioman has been visited for short periods by various collectors. Ridley collected a little in August 1889 on the west coast at a place he calls Nipa Bay. Nanson, a lawyer of Singapore, collected orchids for cultivation; and specimens of these, or of some of them, are in the Herbarium of the Singapore Botanic Gardens. Burkill accompanied Robinson on a visit from June 21st to June 29th, 1915, collecting at Joara Bay and west of it to an altitude of about 1,000 ft. He also visited Tanjong Duatah on the south coast and collected towards the base of the Chula Naga (the "Ass's Ears" of the charts). Kloss paid a short visit to Joara Bay in June, 1916, and collected plants which were sent to Kew.

The writer's collections were made between May 10th and May 29th, 1927. As the primary object of the visit was to collect at as high altitudes as possible, systematic collecting at low levels was at first neglected, although time was found later for a considerable amount of shore collecting.

A camp was established on the path which runs from Joara Bay on the east coast to Ayer Batang Bay on the west. This point, which is roughly half-way between these two places, is known as Sedagong and is about 1,000 feet above sea level. From here a path was cut to the summit of a hill called Gunong Rokam, which the local Malays said was the second highest point on the island. Altitudes were estimated with the help of an aneroid barometer, but it is thought that the instrument read low by as much as 200 feet, and that the summit of Rokam is about 3,000 feet, instead of 2,800 feet as shown on the aneroid. It is apparently the unnamed hill marked on the map of the Malay Peninsula published by the Straits Branch of the Royal Asiatic Society in 1911 and given there as 3,080 ft.

Tanah Runto is a large recent landslide on the northern face of Gunong Rokam. It is visible from the sea both from the north-east and north-west, and is said to have occurred during the heavy rains at the end of 1926. It extended from about 1,200 feet to 2,100 feet above sea level, and was, at a guess, 200 to 400 yards wide. The soil had been completely swept away, exposing the bare rock, over which ran a trickle of water. Vegetation had been obliterated, large trees being uprooted, pulverised and buried in the debris at the foot. Secondary growth had encroached on the edges to a depth of 20 or 30 yards, but the centre was still practically bare except for a few plants of two species of *Macaranga*, *Bridelia* sp., *Acroceras sparsum*, *Lycopodium cernuum*, and a small fern. These were the first colonists, but the slope was so steep and so completely swept of soil that there was little opportunity for any plant to find a foothold.

The ascent of Gunong Kajang (3,383 ft.) was made from the west coast. A camp was established at about 1,000 feet above Telok Paya, and from there a track was followed which led to a small cave (Gua Teh Angin) near the summit, where, it was said, edible birds' nests were periodically collected.

A distinctive feature of the Tioman forests is the presence of exposed granite boulders from between which rise tall trees. Such forest supports remarkably little undergrowth, probably on account of the excellent drainage, which withdraws water beyond the reach of the roots of shrubs, but not beyond the reach of those of large trees. When undergrowth does occur, it is made up to a great extent of bushes of *Taxotrophis ilicifolia*, which with its harsh holly-like foliage, is well suited to withstand dry soil conditions. The western side of the island is appreciably drier than the eastern, due, no doubt, to lesser rainfall.

The summit of Gunong Rokam is a mass of granite rocks covered with humus, supporting a shrubby growth

of such mountain-top plants as *Medinilla*, *Rhododendron*, *Vaccinium*, *Calamus*, and *Pandanus*. It is dry and not moss grown. The summit of Gunong Kajang, on the other hand, has mossy forest. It is a narrow boulder-strewn ridge running east and west, very precipitous on the north and south faces. The trees are 15 to 20 feet tall, thin and spindly, thickly crowded together, covered at the bases of the trunks with mosses and liverworts, which ascend the trunks for a foot or two. The boulders are likewise thickly covered with mosses and liverworts and between them and upon them is a dense cover of small trees, with a small tufted *Calamus* common on the ground. In the dampest spots amongst moss, a fine *Cypripedium*, perhaps *C. Bullenianum*, was common. Just below the summit is a small open patch covered with a dense undergrowth of grasses and sedges with *Nepenthes ampullaria* and *Lycopodium cernuum*, from which rise a number of old flat-topped trees of *Baeckia frutescens* and *Leptospermum flavescens*, fifteen to twenty feet tall.

The Trigonometrical Beacon, erected some twelve or thirteen years ago, is now obscured by a dense secondary growth.

According to Burkill, Gardens' Bulletin Vol. IV, pp. 176, 187, less than eight per cent. of the phanerogamic flora of Pulau Tioman, and about ten per cent. of the flora of the other islands under consideration were known. Perhaps our knowledge may now be put at about twenty per cent., assuming that the number of species the group possesses is approximately the same as the number known from Penang Island.

The following are the local and endemic species. An asterisk indicates that they come from above 2,000 ft., a dagger that they come below that altitude:—

- †*Canarium subcordatum*, *Ridl.*
- †*Garcinia tenuifolia*, *Ridl.*
- **Eugenia ciliaris*, *Ridl.*
- †*Eugenia tiomanensis*, *Ridl.*
- **Begonia tiomanensis*, *Ridl.*
- †*Mussaenda spectabilis*, *Ridl.*
- †*Lasianthus barbellatus*, *Ridl.*
- †*Lasianthus chrysotrix*, *Ridl.*
- †*Kopsia alba*, *Ridl.*
- †*Paraboea tiomanica*, *Burkill.*
- †*Justicia ovalis*, *Ridl.*
- †*Litsea madulifolia*, *Ridl.*
- †*Trigonostemon arboreum*, *Ridl.*
- **Oberonia tiomanensis*, *Hend.*
- **Coelogyne tiomanensis*, *Hend.*
- †*Gastrochilus sub-biloba*, *Valeton.*
- †*Calamus Burkillianus*, *Becc*
- **Carex leucostachys*, *Ridl.*

All these plants are confined to Pulau Tioman, with the exception of *Canarium subcordatum*, which is known only from Pulau Tinggi, and *Garcinia tenuifolia*, which is known both from Tioman and Aor.

These eighteen plants give a figure of about four per cent. for the local specific endemism. Without doubt further exploration will raise this considerably, probably as much as three times, for it is to be expected that the local specific endemism of an isolated island like Tioman will exceed that of an area such as the Taiping Hills, for which the figure is about ten per cent.

Species with an extra-Peninsular distribution, not known from the Peninsula proper:—

- †*Allophylus javensis*, *Bl.* (P. Aor). W. Malaysia to the Philippines.
- †*Allophylus timorensis*, *Bl.* (P. Tinggi, P. Tioman). Malaya to Polynesia.
- †*Casearia leucolepis*, *Turcz.* (P. Tioman). Borneo, Philippines.
- †*Zuccarinia macrophylla*, *Bl.* (P. Aor). Java.
- †*Loxonia acuminata*, *Br.* (P. Tioman). Sumatra, Java.
- †*Endospermum borneense*, *Muell. Arg.* (P. Tioman). Borneo.
- †*Pipturus velutinus*, *Wedd.* (P. Tinggi, P. Tioman). Malaysia.
- †*Boehmeria malabarica*, *Wedd.* (P. Tioman). India to Borneo.

A considerable number of plants from these islands have hitherto been known only from the north and north-west of the Peninsula and are not known to cross to the eastern side of the Main Range. They are:—

- Ternstroemia penangiana*, *Choisy.*
- Glycosmia rupestris*, *Ridl.*
- Atlantia monophylla*, *Correa.*
- Canarium hispidum*, *Bl.*
- Canarium pilosum*, *Benn*, var. *hirtellum*, *Ridl.*
- Paranephelium muricatum*, *Pierre.*
- Schefflera Curtisii*, *Ridl.*
- Schefflera venulosa*, *Harms.*
- Alangium begoniaefolium*, *Baill.*
- Randia exaltata*, *Griff.*
- Ixora multibrachiata*, *Pearson.*
- Pavetta naucleiflora*, *Wall.*
- Solanum decemdentatum*, *Roxb.*
- Cyrtandromoea repens*, *Ridl.*
- Balanophora insularis*, *Ridl.*
- Cleistanthus polyphyllus*, *Williams.*
- Baccaurea sapida*, *Muell. Arg.*

Debregeasia squamata, *Hock. fl.*

Appendicula pendula, *Bl.*

Globba perakensis, *Ridl.*

and the following littoral plants:—

Erythrina indica, *Lam.*

Sophora tomentosa, *Linn.*

Pisonia aculeata, *Linn.*

Of these the following are endemic:—

Ternstroemia penangiana, *Canarium pilosum* var. *hirtellum*, *Schefflera Curtisii*, *Cyrtandromoea repens*, *Debregeasia squamata*, *Globba perakensis*.

The following extend into Siam only:—

Glycosmis rupestris, *Paranephelium muricatum*, *Ixora multibrachiata*, *Cleistanthus polyphyllus*.

The following have a distribution westwards of the Peninsula only:—

Atlantia monophylla, *Pavetta naucleiflora*.

The following have a distribution eastwards only:—

Canarium hispidum, *Appendicula pendula*.

The montane plants of Pulau Tioman, that is, those collected at 2,000 ft., or over, are as follows:—

Dysoxylum cauliflorum, *Hiern* also at sea level.

Gomphandra lanceolata, *King*, var. *angustifolia*,
King

Allophylus glaber, *Roxb.* also at sea level in
P. Tinggi.

Rubus glomeratus, *Bl.*

Dichroa febrifuga, *Lour.*

Baekia frutescens, *Linn.*

Leptospermum flavescens, *Linn.*

Eugenia ciliaris, *Ridl.*

Eugenia pendens, *Duthie* also at low elevations.

Blastus Cogniauxii, *Stapf*

Sonerila erecta, *Jack*

Medinilla speciosa, *Bl.*

Begonia tiomanensis, *Ridl.*

Argostemma Hookeri, *King*

Argostemma spinulosum, *Clarke*

Argostemma unifolium, *Benn.*

Ophiorrhiza discolor, *R. Br.*

Hedyotis congesta, *Wall.*, var. *nicobarica*, *King*

Mussaenda mutabilis, *Hook fil.*, var. *hirsuta*, *King*
also at sea level

Urophyllum trifurcum, *Pearson*

Ixora congesta, *Roxb.*

Ixora stricta, *Roxb.* also at sea level.

Psychotria sarmentosa, *Bl.* also at sea level.

Chasalia curviflora, *Thw.* also at sea level.

- Cephaelis singaporensis*, *Ridl.*
Lasianthus attenuatus, *Jack*
Hydnophytum formicarium, *Jack* also at sea level.
Vaccinium perakense, *Ridl.*
Rhododendron jasminiflorum, *Hook.*
Hoya latifolia, *Don*
Didymocarpus corchorifolia, *R. Br.*
Paraboea densifolia, *Hend.*
Cyrtandromoea acuminata, *Benth. and Hook.*
Strobilanthes latebrosa, *Ridl.*
Justicia vasculosa, *Wall.*
Nepenthes ampullaria, *Jack*
Litsea johorensis, *Gamble*
Breynia discigera, *Muell. Arg.*
Croton erythrostachys, *Hook. fil.*
Trigonostemon longifolius, *Baill.* also at sea level.
Claoxylon longifolium, *Muell. Arg.*
Ficus diversifolia, *Bl.*, var. *lutescens*, *King.*
Ficus fistulosa, *Reinw.*
Oberonia tiomanensis, *Hend.*
Liparis elegans, *Lindl.*
Liparis Wrayi, *Hook. fil.*
Dendrobium hercoglossum, *Rehb. fil.*
also at sea level.
Dendrobium sinuatum, *Lindl.*
Eria nutans, *Lindl.*
Eria teretifolia, *Griff.*
Coelogyne tiomanensis, *Hend.*
Calanthe veratrifolia, *R. Br.*
Bromheadia palustris, *Lindl.*
Appendicula pendula, *Bl.*
Podochilus microphyllus, *Lindl.*
Gastrochilus pictata, *Ridl.* also at sea level.
Amomum ?xanthophlebium, *Baker.*
Smilax calophylla, *Wall.*
Susum malayanum, *Hook.*
Nenga macrocarpa, *Scort.*
Licuala modesta, *Becc.*
Daemonorops calicarpus, *Mart.* also at sea level.
Calamus Diepenhorstii, *Miq.* also at sea level.
Gahnia tristis, *Nees.*
Hypolytrum latifolium, *Rich.* also at sea level.
Carex cruciata, *Wall.*
Carex leucostachys, *Ridl.*
Digitaria marginata, *Link.*, var. *commutatum*, *Hook.*
fil.
Lophatherum gracile, *Brngn.*
Dendrocalamus pendulus, *Ridl.*
Podocarpus imbricatus, *Bl.*
Podocarpus neriifolius, *Don.*

Of these 72 plants, 20 are usually lowland in the Peninsula, 34 are usually montane, and the rest have a wide range of altitude. Thirty-seven per cent. are endemic (*i.e.*, confined to the Peninsula).

In considering the collections as a whole from the point of view of specific endemism, littoral plants and plants which owe their presence on the islands directly or indirectly to man, have been excluded. The percentage of specific endemism is then found to be about 23, a figure which is undoubtedly much too low when it is remembered that, on Tioman at least, the original forest covering has been interfered with by man to a very small extent indeed. Pulau Tioman, at least with reference to its flora, is to be considered part of the Malay Peninsula, and its specific endemism should reach to between forty and fifty per cent. Much more collecting is necessary, in every season of the year, before definite conclusions can be drawn.

The writer is indebted to Mr. H. N. Ridley for determinations of several plants; and to Mr. I. H. Burkill for determinations of the Dioscoreas, and for extracts from the diary of his trip to P. Tinggi and P. Tioman in 1915.

Canarium hispidum, *Bl.* (Burseraceae). P. Aor on the jungle edge, Henderson 18242. This is very rare in the Peninsula, hitherto being known only from Gapis in Perak. It also occurs, however, in Sumatra, Borneo, Java and Celebes.

Paranephelium muricatum, *Pierre* (Sapindaceae). P. Tioman, path across island at about 1000 ft. altitude, Burkill s. n. Very rare in the Peninsula, hitherto known only from Chupeng and Siam. Burkill's specimen agrees closely with the Chupeng specimen, determined by Ridley, but whether this is really Pierre's species appears to be somewhat doubtful. (see Ridl., *Flor. Mal. Pen.*, I, p. 509).

Bauhinia glauca, *Wall.* (Leguminosae). P. Tioman, Ayer Batang at sea level, Henderson 18458; Ayer Surin at about 900 ft., creeping on rocks in open watercourse, Henderson 18950. Rare in the Peninsula, known only from Kota in Perak, and Kuala Lipis in Pahang. Distrib: Tenasserim.

Dichroa febrifuga, *Lour.* (Saxifragaceae). Gunong Rokam, P. Tioman, at an altitude of about 2700 ft., in forest, Henderson 18776. This is not particularly common in the Peninsula on the Taiping Hills and on the Main Range, its southern limit being apparently about Ginting Bidai in Selangor. It is a Himalayan type and extends eastward as far as S. China.

Quisqualis indica, Linn. (Combretaceae). On P. Aor, scrambling in great masses over granite boulders on the edge of old clearings almost at sea level, Henderson 18227. This is very rarely found in a truly wild state in the Peninsula, and it is doubtful if it is wild on P. Aor.

Ixora plumea, Ridl. (Rubiaceae). This plant was found on P. Tioman about 150 ft. above sea level at Bukit Sukak in rather dry open forest, Henderson 18552. An examination of the specimens in Herb. Singapore leads me to the conclusion that *I. plumea*, Ridl. is not distinct from *I. arguta*, Ridl., and must be reduced to that species. *I. arguta*, Ridl. was obtained on P. Aor at about 700 ft. altitude, Henderson 18212.

Planchonella oxyedra, Dub. (1912). (Sapotaceae). *H. J. Lam, Bull. Jard. Bot. Buitenzorg, Serie III, Vol. VIII, Livr. 4, p. 474.* *Sideroxylon littorale*, Ridl., *Flor. Mal. Pen. II, p. 259.* Found on P. Tinggi, Burkill 876, and on the small island P. Tulai to the N. W. of P. Tioman, Henderson 18512. This is very rare in the Peninsula, being known only from Kuantan, but it is widely distributed from Sumatra to the Lesser Sunda Islands, and not necessarily a littoral plant.

Diospyros caliginosa, Ridl. (Ebenaceae). P. Tioman, west of Joara Bay, Burkill 998. A species endemic in the Peninsula and very rare.

Diospyros cymosa, Ridl. P. Tioman, Ayer Besar at about 800 ft. altitude, Henderson 18864. This has been recorded previously only from Telok Sisi, Kuantan.

Ochrosia borbonica, Gmel. (Apocynaceae). P. Tioman, south of Joara Bay, Burkill s. n. A seashore plant, but very rare in the Peninsula. It was collected once by Wallich in Singapore, and by Ridley on Pulau Adang.

Deeringia indica, Zoll. (Amarantaceae). P. Tioman, Sedagong in forest at about 1000 ft. altitude, Henderson 18892. This plant is not very common in the Peninsula, being confined usually to limestone.

Rafflesia Hasseltii, Suringar (Cytinaceae). P. Tioman, Sedagong at about 900 ft. altitude in forest, Henderson 18395, 18908. Not very common in the Peninsula, but fairly widely distributed. It is known also from Sumatra.

Peperomia kotana, C.DC. (Piperaceae). P. Tioman, Sungai Tawar at sea level, Burkill 1004. A rare plant, hitherto known only from the limestone at Kota Glanggi, Pahang.

Ficus Scortechinii, King (Urticaceae). P. Tinggi, Bukit Treh, Burkill 954. A rare species, collected only once before by Kunstler at Kampar, Perak.

Licuala modesta, *Becc.* (Palmae). P. Tioman, Gunong Kajang, 3300 ft., Henderson 18611. A small palm, not common in the Peninsula, and hitherto known only from the Taiping Hills and Kuala Kangsar.

LIST OF ADDITIONS TO THE FLORA OF THE MALAY PENINSULA.

The following list brings together in one convenient place the names of all additions to the Flora of the Malay Peninsula since the publication in 1925 of the last volume of Ridley's "Flora of the Malay Peninsula."

The original place of publication of the species is given, with other references where necessary, and an indication is given of the localities from which the plants come.

The most important publications dealing with the flora of the Peninsula, and those in which most additions will be found are the Kew Bulletin of Miscellaneous Information, the Bulletin of the Botanic Gardens at Buitenzorg in Java (Bulletin du Jardin Botanique de Buitenzorg), and the Gardens' Bulletin, Straits Settlements. Other publications in which additions may from time to time be found are the Journal of the Malayan Branch of the Royal Asiatic Society, the Journal of the Federated Malay States Museums, and the Journal of Botany, British and Foreign.

It is intended to keep this list up to date by publishing supplementary lists at intervals of about a year.

MAGNOLIACEÆ.

Pachylarnax praecalva, *Dandy*, Kew Bulletin, 1927, p. 260. Penang.

Talauma betongensis, *Craib*, Kew Bulletin, 1925, p. 7; *Dandy*, l.c., 1928, p. 189. Kedah Peak.

Talauma gracilior, *Dandy*, Kew Bulletin, 1928, p. 190. Kedah Peak.

Talauma peninsularis, *Dandy*, Kew Bulletin, 1928, p. 192. Pahang: Jerantut.

ANONACEÆ.

Drepananthus pahangensis, *Hend.*, Gard. Bulletin, S.S., Vol. IV, p. 48. Pahang: Baloh; Pulau Manis; Kuantan. Johore: Gunong Panti.

Goniothalamus rotundisepalus, *Hend.*, Gard. Bulletin, S.S., Vol. IV, p. 48. Kelantan: Sungai Renong.

FLACOURTIACEÆ.

Hydnocarpus Humei, *Ridl.*, Kew Bulletin, 1926, p. 470. Selangor: Klang Gates.

GUTTIFERÆ.

Garcinia tenuifolia, *Ridl.*, Kew Bulletin, 1928, p. 72. Pulau Tioman.

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